

SYSTEMS AND METHODS FOR MULTI-TASKING, RESOURCE  
SHARING, AND EXECUTION OF COMPUTER INSTRUCTIONS

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5

ABSTRACT OF THE DISCLOSURE

In a multi-tasking pipelined processor,  
consecutive instructions are executed by different  
10 tasks, eliminating the need to purge an instruction  
execution pipeline of subsequent instructions when a  
previous instruction cannot be completed. The tasks do  
not share registers which store task-specific values,  
thus eliminating the need to save or load registers  
15 when a new task is scheduled for execution. If an  
instruction accesses an unavailable resource, the  
instruction becomes suspended, allowing other tasks'  
instructions to be executed instead until the resource  
becomes available. Task scheduling is performed by  
20 hardware; no operating system is needed. Simple  
techniques are provided to synchronize shared resource  
access between different tasks.